# ASBESTOS-FREE DRYWALL JOINT COMPOUND UTILIZING ATTAPULGITE CLAY AS ASBESTOS SUBSTITUTE

This invention relates to drywall joint treatment compounds which have been improved only in an ecological sense. Drywall joint compounds have substantially all included a portion of asbestos fibers in the formulation. A definite effort is being made to eliminate asbestos fibers in products of all kinds, where these fibers have heretofore been commonly used, due to the belief that asbestos fibers, particularly if inhaled, are dangerous from a health standpoint.

Asbestos fibers have been considered an essential ingredient in joint compounds including the kinds sold in dry powder form for subsequent addition of water and the kinds sold as a ready-mixed aqueous paste. The asbestos fibers have been considered critical in order to obtain the following combination of characteristics all as desired for a preferred joint compound:

1. The plasticity of the paste
2. The water-holding capacity as related to what is referred to as open time and wet edge
3. The avoidance of excessive cohesiveness of the paste
4. Viscosity stability during mixing, storing and use

The plasticity of a joint compound is seen in the ability of the paste to be easily shaped into a smooth surfaced layer with uniform tapered edges using a common broad knife. The water-holding capacity desired is such that when the paste is applied to a dry paper-covered gypsum board surface, the paste does not give up its water to the blotterlike effect of the gypsum board paper, at least for a time sufficient for a worker to complete his smoothing-out operation with the broad knife. The cohesiveness of the paste should be sufficient to prevent any tendencies of the paste to be pulled apart by the broad knife as the knife is being firmly pressed against the paste and pulled along the surface, however it should not resist the ease of deformation by the knife into the desired smooth coating formation. Although it is no problem to form a paste with an initial viscosity after mixing of substantially any form, the presence of asbestos fibers has been of importance in providing a paste which doesn't slowly but steadily change in viscosity subsequent to mixing or even during mixing, if, for example, mixing were inadvertently prolonged.

In accordance with the present invention, joint compounds are provided, free of asbestos, which provide all the characteristics of a joint compound with asbestos substantially as well as the joint compounds with asbestos. The asbestos of prior formulations is replaced by approximately the same weight of a fine powder attapulgite clay. A smaller quantity of polyacrylamide resin is also preferably added.

It is an object of the present invention to provide a novel formulation of a dry powder for use as a drywall joint compound.

It is an object of the present invention to provide a novel formulation of an aqueous paste for use as a drywall joint compound.

It is a further object to provide such joint compounds which are substantially free of asbestos.

It is a still further object to provide asbestosfree joint compounds which have good plasticity, water retention, cohesiveness and viscosity stability.



These and other objects and advantages of the invention will be more readily apparent when considered in relation to the preferred embodiments as set forth in the specification and the drawing in which a wallboard joint section is shown in perspective with joint compound made in accordance with the invention applied thereto and being applied thereto.

Referring to the drawing there is shown a short section of a drywall joint area **10** on which ready-mix joint compound **12** is being hand applied, using a broad knife **14,** forming a smooth-surfaced top coat **16.**

The joint compound **12** shown is made in accordance with the invention however it is applied in the same way, and appears the same, as prior joint compounds.

There are also shown a bed coat **18** of joint compound **12** and a first finish coat **20** of joint compound **12,** both of which have hardened and dried prior to the application of the smooth-surfaced top coat **16.** Bed coat **18** and first finish coat **20** can both be made from the same asbestos-free ready-mix joint compound **12** as is top coat **16.** The bed coat **18** has a narrow paper joint tape **22** embedded within it to provide a reinforcement of the final joint treatment along the joint **24** between the two gypsum wallboards **26.**

The joint compound **12** is an asbestos-free paste formulation suitable for manufacture in paste form, storage, shipment and then ultimate use, all as has been accomplished heretofore with asbestos-containing ready-mix joint compounds.

Joint compound **12** may be made in accordance with the following formulation:

| | PARTS BY WEIGHT |
|---|---|
| Polyvinylacetate latex binder (58% solids) | 6.0 |
| Dipropylene glycol dibenzoate plasticizer | 0.55 |
| Fine ground limestone | 38.0 |
| Dry ground mica | 14.2 |
| Fine ground attapulgite clay | 1.5 |
| Polyacrylamide resin | 0.12 |
| Hydroxypropyl methylcellulose | 0.48 |
| Water | 39.15 |
| | 100.00 |

The polyvinyl acetate binder employed was Union Carbide Latex WC 130. Many other binders can be substituted as is well known in the art, including other latex emulsions, starch, caseins, etc. Dipropylene glycol dibenzoate plasticizer, which is preferably used in conjunction with the polyvinyl acetate binder, was obtained as Benzoflex 9-88 from Velsicol Chemical Corporation.

The fine ground limestone had a fineness of between 80 and 99 percent through a 325 mesh U.S. Standard Sieve. The dry ground mica was Asheville Mica Company's grade AMC. The limestone, mica and the clay are all fine inorganic filler materials each contributing certain physical characteristics to the final product, as fine inorganic filler materials have in prior joint compounds.

The fine ground attapulgite clay is available from Engelhard Minerals and Chemicals Corporation and is identified as Attagel attapulgus clay, and is preferably Attagel 40. A typical chemical analysis of the Attagel 40 is: